

RECLAMATION

Managing Water in the West

Draft Environmental Assessment and Finding of No Significant Impact

Madera Irrigation District Pilot Recharge and Recovery Project at Madera Ranch



U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
Sacramento, California

February 2007

Draft
FINDING OF NO SIGNIFICANT IMPACT

**Madera Irrigation District Pilot Recharge and Recovery Project at Madera
Ranch (Up to 11,000 Acre Feet)**

Recommended: _____ Date: _____
Environmental Specialist

Recommended: _____ Date: _____
Environmental Specialist

Recommended: _____ Date: _____
Program Manager

Approved: _____ Date: _____
Regional Resources Manager

FONSI No. _____



U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
Sacramento, California

Madera Irrigation District Pilot Recharge and Recovery Project at Madera Ranch

The Bureau of Reclamation (Reclamation) has found that an environmental impact statement is not required for the approval of the pilot recharge and recovery of Madera Irrigation District's (MID) Friant Division Central Valley Project (CVP) water at Madera Ranch. The Environmental Assessment (EA) for this pilot recharge and recovery approval is incorporated by reference into this Finding of No Significant Impact (FONSI), and supports this FONSI.

The proposed action is Reclamation's approval of the pilot recharge and recovery of up to 11,000 AF/Y of MID's Friant Division CVP water between February 2007 and April 2009. The recharged water would eventually be recovered by pumping groundwater using existing wells within MID boundaries (Madera Ranch property overlaps the recovery area). Approval of these actions would allow MID to use their 2006-2009 Friant Division allocations to collect data on recharge rates and groundwater hydrology in the area, thereby supplementing evaluations made about the suitability of the area for future recharge and banking operations. Reclamation has a need to approve proposed water recharge outside a CVP contractor's service area based on contractual requirements and in compliance with State and Federal law.

Reclamation's finding that implementation of the proposed action would result in no significant impact to the quality of the human environment is supported by the following factors:

1. The Proposed Action is subject to the following conditions:
 - a. Only existing facilities would be used to convey, recharge, and recover Friant Unit CVP water; no new construction would be required.
 - b. MID would recharge Friant Unit CVP water via in-lieu means only to the extent that it is needed for irrigation and only within MID's service area.
 - c. MID would recharge Friant Unit CVP water via the existing upland drainage (swale system) and a portion of Gravelly Ford Canal to an extent not exceeding the amount of water that those features can contain without spilling into surrounding areas.
 - d. MID would limit its recovery of water to 90 percent of the amount recharged.
 - e. Recovered Friant Unit CVP water would be used only for irrigation purposes and only for currently cultivated lands on Madera Ranch that lie within MID's service area.

2. Surface water - The proposed action involves recharging 11,000 AF/Y of Friant Unit CVP allocations outside Madera Irrigation Districts service area beginning February 2007 and ending April 2009. The recharge effort involves a small amount of water when compared to the overall water supplies for MID. Overall water supplies would not increase or decrease. Overall surface water quality and quantities would not change. The Proposed Action would result in no changes to CVP facilities operations and would not affect surface water resources.

3. Groundwater - The delivery of up to 11,000AF of Friant Division CVP water to Madera Ranch for direct recharge would help protect the local aquifer from overdraft in the interim period and provide some benefit to all water users that utilize groundwater from the aquifer. In addition, direct recharge would allow MID to collect data on recharge rates and groundwater hydrology. Groundwater resources in MID would improve slightly in the short-term.

4. Biological Resources - Demands have been met and conditions in MID that support biological resources would not change. No natural waterways containing sensitive fishes would be affected. Reclamation has determined the Proposed Action would have no effect on federally proposed or listed threatened and endangered species or their proposed or designated critical habitat. No further consultation is required under Section 7 of the Endangered Species Act. This determination is based on the fact that the Proposed Action involves water already allocated and available to MID and all water demands in MID have been met. Habitat types and conditions that support biological resources in MID would not change. No native lands or lands fallowed and untilled for three years or more would be converted or cultivated with CVP water.

5. Land Use - The Proposed Action would not change land use conditions from existing conditions. All water would move through existing facilities and be placed on established agricultural lands within MID or within the natural swales at Madera Ranch. None of the Friant Division CVP water would be used to place any untilled or new lands into production, or to convert undeveloped land to other uses.

6. Cultural Resources - Based in the information presented in the environmental assessment, there would be no potential to impact cultural resources.

7. Indian Trust Assets - The environmental assessment indicates that there are no Indian Trust Assets in MID, therefore, the proposed action would not affect any Indian Trust Assets.

8. Socioeconomic Resources - The Proposed Action would continue to support the economic vitality in the region. MID is responsible for managing water for the benefit of agriculture, since they exist to support growers within their respective

districts. Groundwater recharge would benefit local economic conditions and agricultural employment.

9. Environmental Justice - The Proposed Action would not disproportionately affect minorities or low-income populations and communities because there would be no change in land management and there would not be significant adverse human health or environmental effects.

RECLAMATION

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Draft Environmental Assessment

Madera Irrigation District Pilot Recharge and Recovery Project at Madera Ranch



U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
Sacramento, California

February 2007

TABLE OF CONTENTS

| | | |
|-----------|--|----|
| Section 1 | Purpose of and Need for Action | 1 |
| 1.1 | Background | 1 |
| 1.2 | Purpose and Need | 1 |
| 1.3 | Scope | 1 |
| 1.4 | Potential Issues..... | 1 |
| Section 2 | Alternatives Including Proposed Action..... | 6 |
| 2.1 | Alternative A: No Action..... | 6 |
| 2.2 | Alternative B: Proposed Action | 6 |
| Section 3 | Affected Environment & Environmental Consequences..... | 11 |
| 3.1 | Surface Water Resources | 11 |
| 3.2 | ground Water Resources | 13 |
| 3.3 | Land Use | 17 |
| 3.4 | Biological Resources | 19 |
| 3.5 | Cultural Resources | 24 |
| 3.6 | Indian Trust Assets | 29 |
| 3.7 | Socioeconomic Resources | 30 |
| 3.8 | Environmental Justice | 31 |
| Section 4 | Consultation and Coordination | 32 |
| 4.1 | Fish and Wildlife Coordination Act (16 USC § 651 et seq.) | 32 |
| 4.2 | Endangered Species Act (16 USC § 1521 et seq.)..... | 32 |
| 4.3 | Magnuson- Stevens Act Fishery Conservation and Management Act (16 USC § 1801 et seq.) 32 | |
| 4.4 | National Historic Preservation Act (15 USC § 470 et seq.) | 32 |
| Section 5 | List of Preparers and Reviewers | 33 |
| Section 6 | References..... | 33 |
| Section 7 | Appendix A. Fish and Wildlife Species List | 35 |

List of Figures and Tables

| | |
|---|----|
| FIGURE 1: MID GENERAL LOCATION MAP | 3 |
| FIGURE 2. PROPOSED PROJECT LOCATION | 4 |
| FIGURE 3. PILOT TEST LOCATION..... | 5 |
| FIGURE 4. CONVEYANCE MAP | 10 |
| TABLE 1: MID Water Amounts Received (AF) by Source for 2004 – August 2006. | 11 |
| FIGURE 5. GROUNDWATER FLOW MAP..... | 15 |
| TABLE 2: LAND USE IN MADERA IRRIGATION DISTRICT | 17 |
| FIGURE 6. HABITATS AT MADERA RANCH..... | 21 |
| TABLE 3: FEDERAL STATUS SPECIES ON QUAD LISTS FOR MID | 22 |
| TABLE 4. CULTURAL RESOURCE SITES IDENTIFIED AT MADERA RANCH..... | 27 |

List of Acronyms, Abbreviations and Definition of Terms

AF – acre-foot (feet)
AF/Y – acre feet per year
CNDDDB – California Natural Diversity Database
Contract Year/Water Year - Begins March 1st and ends February 28th of the following year.
CVP – Central Valley Project
EA – Environmental Assessment
EO – Executive Order
ESA – Endangered Species Act
FKC – Friant-Kern Canal
FWCA – Fish and Wildlife Coordination Act
FWS – U .S. Fish and Wildlife Service
FONSI – Finding of No Significant Impact
ITAs – Indian Trust Assets
M&I – Municipal and Industrial water
MID- Madera Irrigation District
NEPA – National Environmental Policy Act
NRHP – National Register of Historic Places
Reclamation – U.S. Bureau of Reclamation
Section 215 Surplus Water – Surplus water as defined under Section 215 of the Reclamation Reform Act
SWRCB – State Water Resources Control Board
WESP – Water Supply Enhancement Project
WWD – Westlands Water District

SECTION 1 PURPOSE OF AND NEED FOR ACTION

1.1 BACKGROUND

Madera Irrigation District (MID) has independently proposed a pilot project to recharge surface water beneath the property known as Madera Ranch (Ranch). The Ranch has been the subject of many studies to assess its suitability for such a project, including investigations by Reclamation, Azurix Corporation, and MID. Results of the subject pilot project would be used to confirm assumptions made to date regarding the suitability of the Ranch for MID's longer term and larger Water Supply Enhancement Project (WSEP).

1.2 PURPOSE AND NEED

The Bureau of Reclamation (Reclamation) proposes to approve the recharge and recovery of Friant Unit Central Valley Project (CVP) water from MID (Figure 1) at the Ranch. Reclamation approval would allow MID to use their 2006-2009 Friant allocations to recharge water in order to collect data on recharge rates and groundwater hydrology in the area, thereby supplementing evaluations made about the suitability of the area for future recharge and banking operations. The proposed pilot project is being administered by the Madera Irrigation District, but requires Reclamation's approval for the recharge of CVP water outside MID's service area based on contractual requirements and in compliance with State and Federal law.

1.3 SCOPE

In accordance with Section 102(2) (c) of the National Environmental Policy Act of 1969 (NEPA), as amended, Reclamation has prepared this environmental assessment (EA) which analyzes the delivery, recharge and recovery of up to 11,000AF/Y of MID allocated Friant Unit CVP water supply.

1.4 POTENTIAL ISSUES

The potentially affected resources in the project vicinity include:

- Surface Water Resources
- Groundwater Resources
- Biological Resources
- Land Use
- Cultural Resources
- Indian Trusts Assets
- Socioeconomic Resources
- Environmental Justice

The Proposed Action would be subject to the following conditions:

1. Only existing facilities would be used to convey, recharge, and recover Friant Unit CVP water; no new construction will be required.
2. MID would recharge Friant Unit CVP water via in-lieu means only to the extent that it is needed for irrigation and only within MID's service area.
3. MID would recharge Friant Unit CVP water via the existing upland drainage (swale system) and a portion of Gravelly Ford Canal to an extent not exceeding the amount of water that those features can contain without spilling into surrounding areas.
4. MID would limit its recovery of water to 90 percent of the amount recharged.
5. Recovered Friant Unit CVP water would be used only for irrigation purposes and only for currently cultivated lands on Madera Ranch that lie within MID's service area.

FIGURE 1: MID GENERAL LOCATION MAP

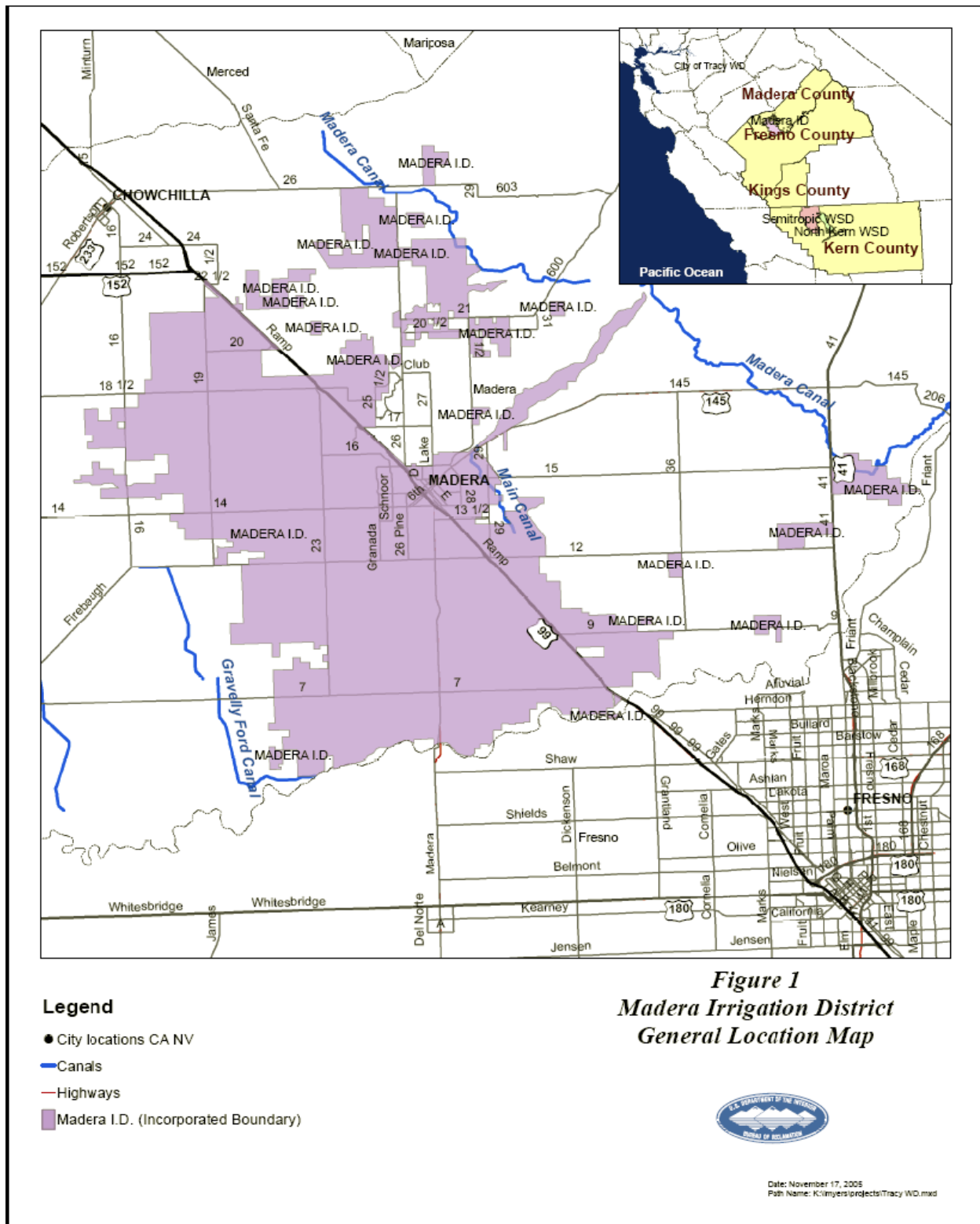


FIGURE 2. PROPOSED PROJECT LOCATION

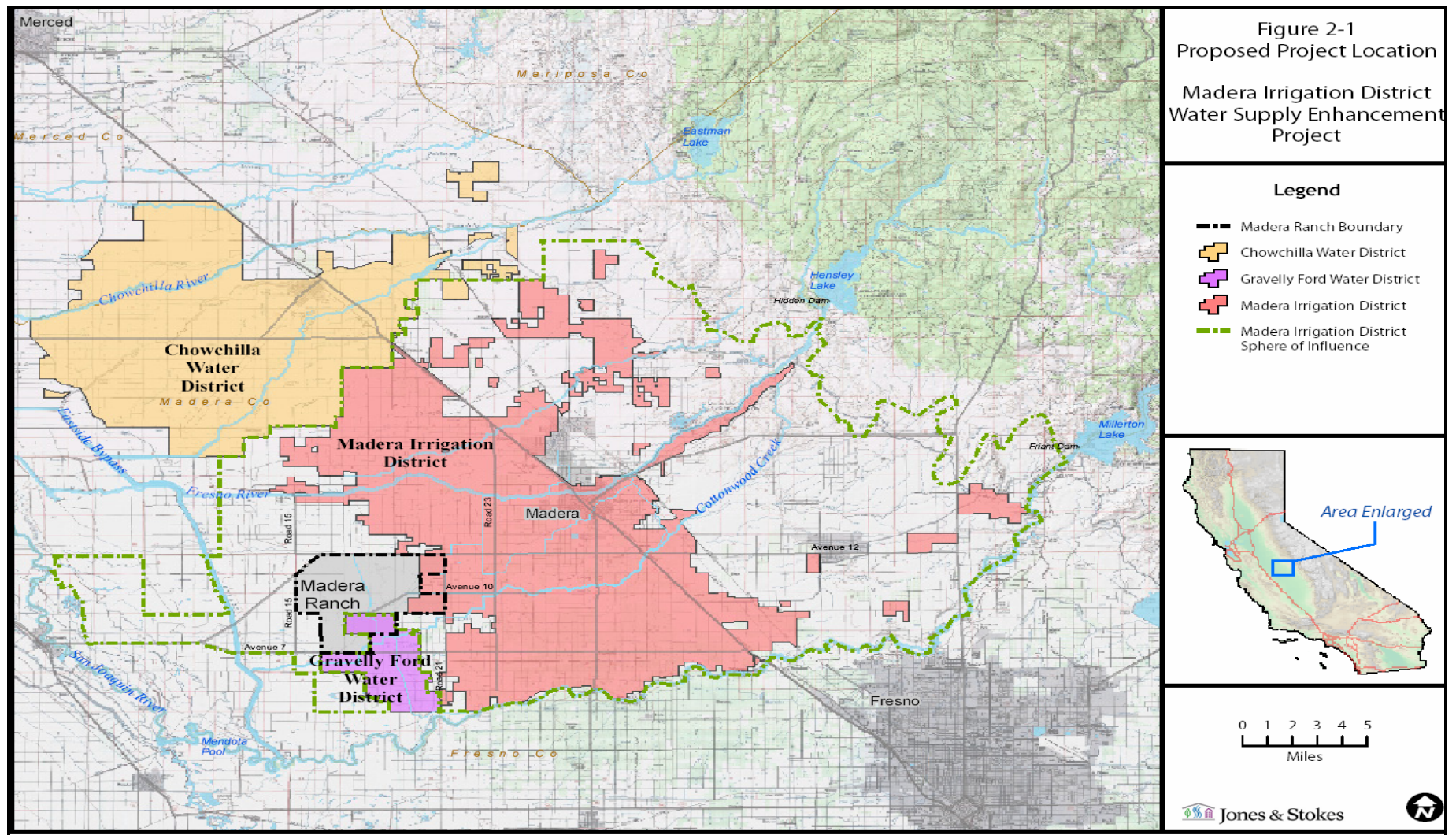
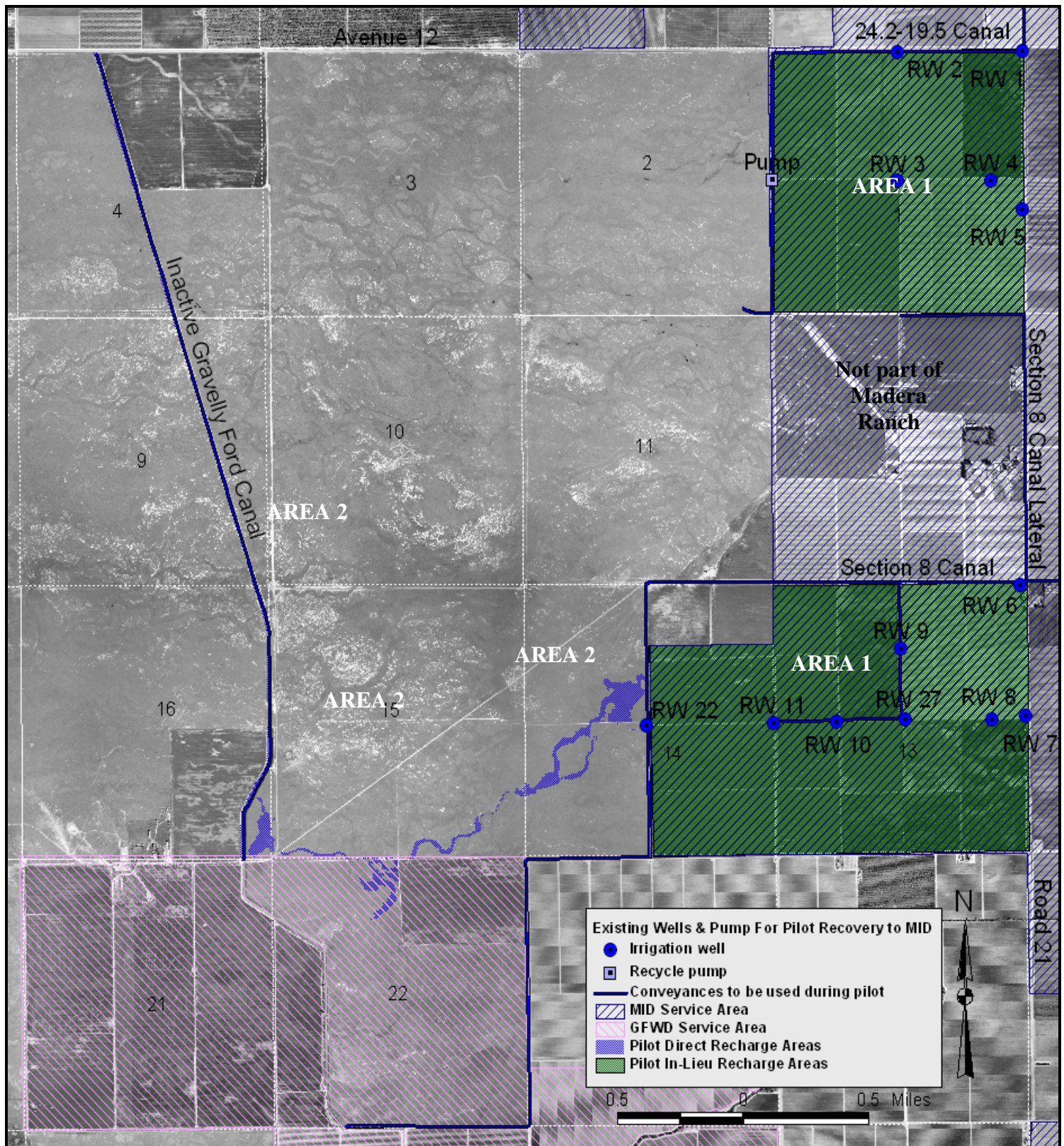


FIGURE 3. PILOT TEST LOCATION



SECTION 2 ALTERNATIVES INCLUDING PROPOSED ACTION

2.1 ALTERNATIVE A: NO ACTION

Under the No Action alternative, Reclamation does not approve the recharge and recovery of up to 11,000AF/Y of MID's Friant Unit CVP water outside their service area. The existing Madera Ranch Pilot Project would continue using MID's pre-1914 water rights on the San Joaquin River to recharge water at the Ranch. Friant Unit CVP water would continue to be used for recharge within MID's service area. MID's currently active ongoing Pilot recharge project is described below.

Pilot Recharge of Surface Water through In-lieu Means within the MID Service Area

MID began their Pilot Recharge project at the Ranch in 2005. The initial recharge efforts involved both CVP and non-CVP water. Recharge of the CVP water has been limited to those areas within MID's service area (Figure 3, Sections 1, 13 and one-half of Section 14 of the Ranch (totaling 1,500-acres)). All surface water deliveries have involved existing functional MID canals and turnouts. Prior to 2005 these lands were irrigated solely with groundwater from at least 1998 (likely since the early 1990's). Under the No Action alternative, MID would continue to deliver up to 7,000 AF/Y of surface water provided by Reclamation (as available) to these existing MID service area lands in-lieu of groundwater pumping, resulting in the storage of an equivalent volume of water underground.

2.2 ALTERNATIVE B: PROPOSED ACTION

2.2.1 Pilot Recharge and Recovery of Friant Unit CVP Water

Madera Irrigation District (MID) proposes to perform pilot recharge and recovery of Friant Unit CVP water on portions of the property known as the Ranch (Figure 3). Friant Unit CVP water used for this pilot project would be surplus to MID's needs. This surplus determination would be based on yearly hydrology and management practices by MID. Water demands within the district would have been met before Friant Unit CVP water could be used for direct recharge at the Ranch.

The Proposed Action consists of the following components:

1. Pilot direct recharge through an existing upland drainage and an inactive portion of the Gravelly Ford Canal outside of the MID service area;
2. Pilot recovery of water by existing wells within the MID service area; and,
3. Monitoring recharge and recovery activities.

The objectives of MID's pilot project are as follows:

1. to evaluate how recharge performance changes (if at all) as the application volumes scale up
2. to evaluate the performance of different soil types
3. to evaluate the degree of water table mounding as water is applied
4. to evaluate how the water table mound dissipates over time
5. to develop water accounting procedures
6. to evaluate groundwater quality impacts, if any.

Pilot Direct Recharge through an Existing Upland Drainage and an inactive portion of the Gravelly Ford Canal Outside of the MID Service Area

Commencing February 2007 and extending until April 1, 2009, MID would recharge up to 11,000 AF/Y of their Friant Unit CVP water by direct recharge methods using a natural swale system and an inactive portion of the earthen Gravelly Ford Canal adjacent to, but outside of, the MID service area (Figure 3).

The swale system in Sections 14, 15, 16 and 22 (approximately 20 acres) (Figure 3) was historically used as part of the Ranch irrigation system and includes several interconnecting ditches. In recent years the swale system received irrigation spill water. Since 2005, MID has performed pilot recharge within this swale system using MID's pre-1914 water rights (non-CVP water). This swale system connects to the inactive portion of the Gravelly Ford Canal, which trends in a northwesterly direction across the Ranch, totaling 28 acres (Figure 3). This inactive canal is earthen and overlies very sandy soils that are expected to provide high recharge rates.

Evaluations by Azurix and MID measurements indicate that the swale system is capable of recharging between 0.5 and 1.0 acre-foot per day per acre (feet/day), providing approximately 10 to 20 acre-feet per day of recharge capacity (5 to 10 cfs) (Dorrance, 2005). The inactive portion of the Gravelly Ford Canal will provide an unknown amount of additional recharge capacity. The recharge capacity would be determined as part of MID's pilot project. MID proposes to directly recharge their Friant Unit CVP water using the swale system and the inactive canal when water is available above in-lieu recharge needs. The existing MID Section 8 Canal and an existing Ranch ditch running north-south through the center of Section 14 will be used to deliver water into the Sections 14, 15, 16 and 22 swale system, which in turn would convey water to the inactive Gravelly Ford Canal.

In all cases, existing weirs and metering stations located at the Section 8 canal (before water enters the swale) and at the swale (before water enters the GFWDC) would be used to measure flow on a daily basis. Surface flow would be regulated so that inundation does not exceed capacity of the swale system. The actual area of inundation would be documented using monthly walking GPS surveys uploaded to a GIS system and overlain on an aerial photograph of the Ranch. Satellite imagery (QuickBird, 2 foot resolution) may also be used to supplement these walking surveys. The conveyance capacity to the Ranch of the Section 8 Canal is approximately 20 cfs (40 acre-feet per day), indicating that during times when water is not being

delivered to fields for in-lieu recharge, the swale and inactive Gravelly Ford Canal would likely be capable of accepting the entire flow.

The evapotranspirative losses associated with direct recharge, which can range up to an estimated 7% in the area of Madera Ranch, would be computed and reported monthly. To help avoid evapotranspirative losses, MID intends to preferentially use in-lieu recharge methods whenever possible, supplemented by direct recharge methods when there is no in-lieu irrigation demand. Depending on water availability and in-lieu operational needs, MID estimates that up to 11,000 AF/Y could be recharged using direct recharge methods.

Pilot Project Performance Evaluation

MID's pilot project would include the following data collection:

1. daily surface water flow measurements and documentation of which fields are receiving surface water (for recharge) in lieu of groundwater pumping;
2. daily MID meteorological station and CIMIS station reference ET monitoring;
3. weekly groundwater level and irrigation totalizing flow meter measurements (with documentation of on/off condition);
4. monthly GPS mapping of inundated swale area, potentially supplemented with Quickbird satellite imagery.

In addition, MID performs bi-annual sampling of irrigation wells and monitoring wells. All flow, water level and water quality data would be entered into a relational database, which already includes baseline data for an approximately 100-square-mile area surrounding the Ranch for a period going back several decades. The data would be interpreted to evaluate pilot project performance.

Recharge Rates:

In-lieu recharge is a direct one-for-one exchange for groundwater that would otherwise be pumped. This accounting would be tabulated on both a total and per acre basis. Direct recharge to the swale and Gravelly Ford Canal would be estimated by computing and subtracting evaporative losses from total application rates. Results would be reported on both a total and per acre basis.

Aquifer Response and Recoverable Water:

Groundwater levels in irrigation wells and monitoring wells would be plotted and statistically analyzed to determine the degree of response to direct and in-lieu recharge, taking into account background water level variations that are unrelated to the project. In addition, two existing shallow wells screened less than 50 feet below the surface would be monitored to evaluate the potential evolution of perched conditions near the pilot swale. Water levels would be statistically analyzed during recovery cycles to evaluate if 90 percent of the recharged water can be recovered without causing water levels to fall below baseline conditions at the property boundary. Total dissolved solids concentrations in monitoring and irrigation wells before, during and after the test would be compared to evaluate potential impacts.

Construction

Implementation of this pilot project would rely entirely on existing facilities; no construction would be required. The only new activity would be the installation of totalizing flow meters on existing turnouts and agricultural wells to measure recharge application volumes and recovery volumes. Installation of these devices would not involve soil disturbing activities.

2.2.2 Required Conveyance Systems

Conveyance of MID Friant Unit CVP water to the Ranch and the return is described below.

2.2.2.1 Delivery of Friant Unit CVP Water to Madera Ranch

Up to 11,000AF/Y of MID Friant Unit CVP water would be released from Millerton Reservoir from the period between February 2007 and April 1, 2009, conveyed via the Madera Canal, for diversion into the Fresno River, an integral part of the MID conveyance system. The water would be diverted at the Franchi Weir (off of the Fresno River) for delivery into the Main No. 1 and No. 2 Canals. These canals converge into the Section 8 canal 2 miles east of the Ranch. From the Section 8 canal, water would be delivered into the Ranch swale system through 2 lateral canals (Figure 4).

Alternately, water would continue to be conveyed in the Madera Canal further to the northwest past the Fresno River to the 24.2 canal system which shares a channel with Dry Creek in its upper reaches. Water flowing down the 24.2 system would either be diverted to the north-east corner of the ranch through the 24.2-19.5 lateral or to the south-east side of the ranch through an inter-tie with Main No. 1 and Section 8 canal system.

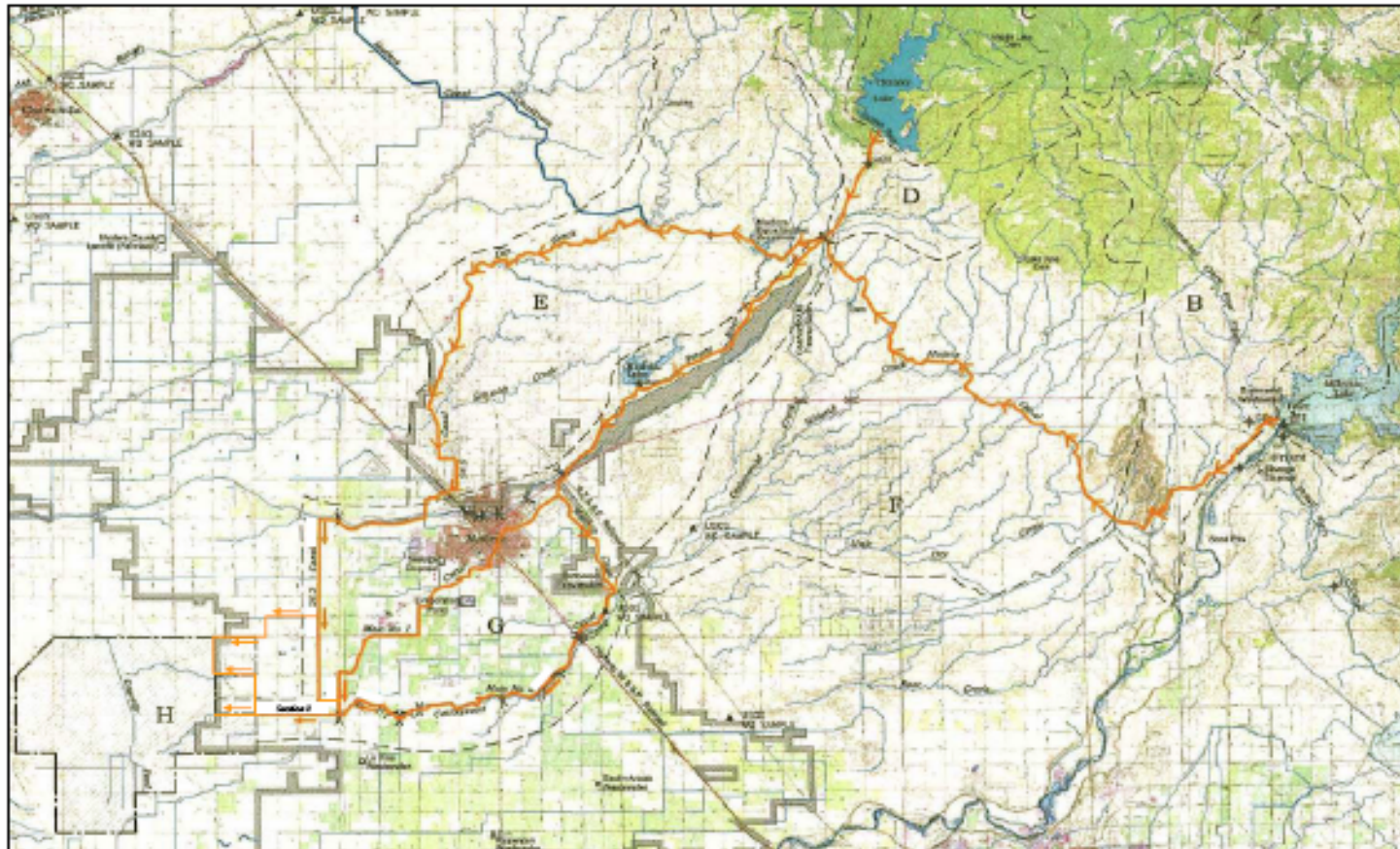
Demand and delivery capacity within MID would determine which canal system (Main No. 1, No. 2 or 24.2) is utilized to convey the water to the Ranch. To account for conveyance and other losses (including aquifer losses), a 10 percent loss shall be recognized.

2.2.2.2 Pilot Recovery of Recharged Water by Existing Agricultural Wells within the MID Service Area

As depicted on Figure 3, the 1,500-acres of Ranch land within the MID service area are regularly irrigated using a system of 13 wells. Following cessation of pilot recharge operations, normal groundwater pumping would resume using the 13 existing wells within districts' boundaries and a like amount of groundwater (not to exceed 90% of surface water directly recharged) would be recovered and used on lands within MID service area. MID does not expect to recover the same molecules of water. It is understood that the directly recharged water would benefit MID in the long term by providing data which may support the future recharge and banking of CVP water at the Ranch.

During the recovery phase, MID would record total volumes of groundwater pumped to the MID service area lands on a weekly basis and would measure water levels in select wells on a weekly basis. Depending on irrigation demand, recovery may take up to five years beginning April 2009. The amount of water recovered on an annual basis shall not exceed 90% of the total amount of water stored by direct recharge per year.

FIGURE 4. CONVEYANCE MAP



This figure depicts how water will be gravity delivered to Madera Ranch through existing conveyances for the pilot recharge project. Millerton Lake water (Friant water, MID pre-1914 water rights and other MID entitlements) will be delivered from Millerton Lake into the Madera Canal, flowing northwest for diversion into the Fresno River, an integral part of the MID conveyance system. Water flowing down the Fresno River will be diverted at the Franchi Weir for delivery into the Main No. 1 and No. 2 Canals. The Main No. 2 Canal shares a channel with Cottonwood Creek in its lower reaches. The Main No. 1 and No. 2 Canals converge into the Section 8 canal 2 miles east of the ranch. The Section 8 canal delivers water into the ranch through 2 laterals. Alternately, water will continue to be conveyed in the Madera Canal further to the northwest past the Fresno River to the 24.2 Canal System which shares a channel with Dry Creek in its upper reaches. Water flowing down the 24.2 system will either be diverted to the north-east corner of the ranch through the 24.2-19.5 lateral or to the south-east side of the ranch through an inter-tie with the Main No. 1 and Section 8 canal system. Similarly, Hensley Lake (Hidden Dam) water (MID water rights and USBR contract) will be conveyed down the Fresno River for diversion into the MID system in the same manner as summarized above.

SECTION 3 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

3.1 SURFACE WATER RESOURCES

3.1.1 Affected Environment

The San Joaquin River is the major surface water feature south and west of the Project area (Figure 2). The total San Joaquin River basin drains 7,395 square miles, 4,320 square miles of which are in the Sierra Nevada, and 2,273 are in the San Joaquin Valley (Kratzer et al 2004). The other two major rivers within the action area are the Fresno River and the Chowchilla River. The Fresno River drains a watershed of approximately 236 square miles above Buchanan Dam. The Chowchilla River, like the Fresno River, has ephemeral flows consisting of large winter floods and no summer flows. Minor drainages in the area include Cottonwood Creek and its tributaries. These minor drainages convey water from the Madera Canal to local canals, and all of their flows are diverted for use within the district.

Madera Irrigation District

MID (Figure 1) has a contract with Reclamation for 85,000 acre-feet per year (AF/Y) of Class 1 and 186,000 AF/Y of Class 2 water from the Friant Division of the CVP. In an average year, MID receives 100% of their Class 1 water and approximately 48% of their Class 2 water, totaling approximately 174,000 AF/Y. In 1975, Hidden Dam was completed on the Fresno River providing a more regulated flow. MID entered into a long-term Contract with Reclamation for water from Hensley Lake behind Hidden Dam for 24,000 AF/Y. MID has pre-1914 water rights, as well, for approximately 20,000 AF/Y from the Soquel-Big Creek (MID, 2001). Table 1 below describes the source of water and actual amounts received from 2004 to August 2006.

TABLE 1: MID WATER AMOUNTS RECEIVED (AF) BY SOURCE FOR 2004 – AUGUST 2006.

| Year | Class I | Class II | 215/Surplus | Carryover from previous year | Transferred In | Hidden Dam | Soquel-Big Creek | Free Water | Total |
|-----------------|---------|----------|-------------|------------------------------|----------------|------------|------------------|------------|--------|
| 2004 | 84477 | 15108 | 0 | 7294 | 10531 | 24000 | 7942 | 0 | 149352 |
| 2005 | 48588 | 24846 | 40513 | 0 | 0 | 24000 | 15880 | 0 | 153827 |
| 2006 (thru Aug) | 19667 | 19181 | 45421 | 0 | 0 | 24000 | 6982 | 51946 | 147530 |

Madera Canal

The 35.9-mile-long Madera Canal carries water northerly from Millerton Reservoir to furnish lands in Madera County with a supplemental and a new irrigation supply. The canal, completed in 1945, has an initial capacity of 1,000 cfs, decreasing to a capacity of 625 cfs at the Chowchilla River. In 1965, the canal lining from the headworks to milepost 2.09 was raised so that 1,250 cfs could be delivered. MID receives water supply from Millerton Reservoir through Madera Canal.

Gravelly Ford Canal

The Gravelly Ford Canal trends in a northwesterly direction across the Ranch, totaling 28 acres (Figure 3). This inactive canal is earthen and overlies very sandy soils that are expected to provide high recharge rates.

Surface Water Quality

Surface waters from the San Joaquin River, Fresno River, and Cottonwood Creek have been used to irrigate land around and including the action area for more than 100 years. In general, these waters are known for their high quality. The average specific conductance for the San Joaquin River is 45 µmhos/cm (microms per centimeter) (approximately 28 milligrams per liter [mg/l] TDS; which indicates a much lower TDS than groundwater beneath the action area, which averages 466 µmhos/cm (approximately 291 mg/l TDS).

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative, surface water supplies would be the same as the existing conditions described above. Surplus water could remain in Millerton Reservoir if MID opted to carry-over this water in Contract Year 2007 and subsequent years. The storage of this water in Millerton Reservoir would be temporary and would not lead to long-term benefits for water quantity, quality or temperature.

Proposed Action

Under the Proposed Action, between February 2007 and April 1, 2009, up to 11,000AF/Y, of MID Friant Unit CVP water supply would be used for direct recharge through an upland drainage (swale system) and an inactive portion of the Gravelly Ford Canal. This water would be surplus to MID's yearly water demands. MID would not overburden other water resources to make this water available. MID's surplus water would be delivered using natural waterways and canals to Madera Ranch for direct recharge. Water would be recovered in an amount not exceeding 90% of the recharged amount when recharge activities cease in April 2009.

The Proposed Action would improve the local groundwater aquifer. MID would be able to collect data about recharge rates and groundwater hydrology and levels within the Ranch and surrounding areas. This data could be used to determine the suitability of the Ranch to operate as a water bank in the future. No new facilities would be needed as a result of the Proposed Action. The Proposed Action would not interfere with the normal operations of Friant Dam, or other CVP facilities.

In relation to MID's yearly allotment of Friant Unit CVP water, the Proposed Action involves a small amount of water (up to 11,000AF/year). All surface water would be diverted with or without the Proposed Action. Overall water supplies would not increase or decrease. The Proposed Action would not result in substantial changes to CVP operations and would not adversely affect surface water resources.

Cumulative Effects

Reclamation has approved other proposals in Water Year 2006 from MID which include water transfers and groundwater banking. All proposals have been addressed or are currently being addressed in separate environmental documents. One such proposal involved a MID transfer of up to 15,000AF of Friant Unit CVP water to Semitropic. The environmental impacts were analyzed in an EA titled *Madera Irrigation District Transfer of Friant Central Valley Project Water to Semitropic Water Storage District as Facilitated by North Kern Water Storage District*. This transfer was approved by Reclamation on December 7, 2006.

Additional Water Year 2006 projects include MID's Transfer, Banking, and Exchange of Friant CVP Water to Westlands Water District (Up to 25,000AF). The environmental impacts of these actions were analyzed in EA titled *Madera Irrigation District Transfer, Banking and Exchange of Friant Central Valley Project Water to Westlands Water District as facilitated by North Kern Water Storage District and Kern County Water Agency*. These actions were approved by Reclamation on January 12, 2007.

Under the No Action Alternative, MID would perform in-lieu recharge of up 7,000 AF/Y of Friant Unit CVP surface water within district boundaries. This action would not contribute any cumulative affects to surface water resources. In-lieu recharge would be preferentially utilized before direct recharge methods.

MID has two proposals currently being reviewed by Reclamation. The first is a long-term banking proposal whereby Madera Ranch would be used to bank water supplies (CVP water) by the district. The other proposal is MID's WSEP, which is currently waiting congressional funding authorization to conduct a Reclamation Feasibility study. It is uncertain as to when these proposals would be final and implemented. This proposed action would occur for three years and is unlikely these proposals would overlap with the proposed action; therefore, no cumulative impacts to surface water resources are likely.

3.2 GROUND WATER RESOURCES

3.2.1 Affected Environment

MID

Madera Ranch is located in the Madera Subbasin of the San Joaquin Valley Groundwater Basin. The total surface area of the subbasin is 394,000 acres or 614 square miles (California Department of Water Resources 2004). The Madera Subbasin (DWR Number 22.06) is bounded on the north by the Chowchilla Subbasin (DWR Number 22.05), on the south by the Kings Subbasin (DWR Number 22.08, separated by the San Joaquin River), on the west by the Delta-Mendota Subbasin (DWR Number 22.07, separated by the San Joaquin River), and on the east by the crystalline bedrock of the Sierra Nevada Foothills.

Subsurface geologic conditions

The Madera Subbasin groundwater aquifer system consists of unconsolidated continental deposits, including older Tertiary and Quaternary age materials overlain by younger Quaternary deposits. Groundwater in the Madera Subbasin is recharged by natural river and stream seepage, deep percolation of irrigation water, canal seepage, and intentional recharge.

As detailed in MID's AB3030 GMP and in DWR's Bulletin 118 (California Department of Water Resources 2004), the Madera Subbasin has been subjected to severe long-term groundwater overdraft. A variety of overdraft estimates have been compiled for various portions of the basin. At the request of MID, Ken Schmidt and Associates compiled the results of these various efforts to provide an estimate of overdraft for the entire basin. Based on the compiled

prior work and independent calculations, Schmidt estimated an average groundwater overdraft of 100,000 AF/Y as of 2000 (Schmidt pers. comm.).

Groundwater levels in the Madera Subbasin have declined an average of 67 feet since 1945 and 30 feet since 1980 (California Department of Water Resources 2005). Although there have been some years of slight recovery, the overall trend remains downward. Similar groundwater level declines have occurred in the Project vicinity. Since 1943, groundwater levels beneath the Project vicinity have declined at least 90 feet, and the trend remains downward.

The available storage capacity in the dewatered aquifer beneath the Project vicinity (above the current water table) has been estimated to range from 286,720 to 573,440 acre-feet, with a most commonly cited estimate of 400,000 acre-feet (CALFED Bay-Delta Program 2000; Bureau of Reclamation 1998).

Groundwater Flow

Groundwater flow is generally to the southwest in the eastern portion of the subbasin and to the northwest in the western portion. Locally, however, groundwater flow directions vary significantly because of the intense agricultural, municipal, and industrial groundwater pumpage, which has also caused overdraft in a variety of locations, including the Project vicinity (Madera Irrigation District 1999; California Department of Water Resources 2004; Schmidt pers. comm.).

FIGURE 5. GROUNDWATER FLOW MAP

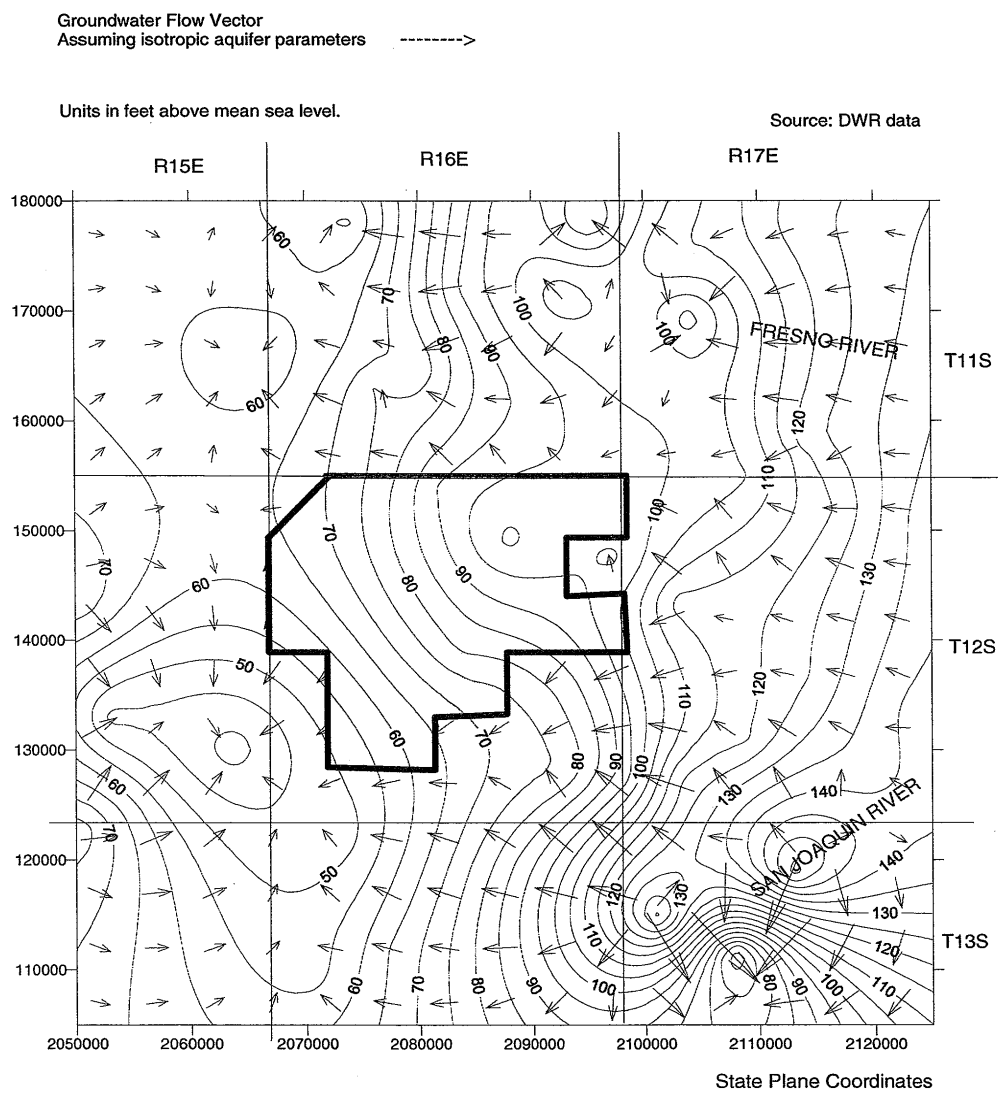


Figure 4-18. Groundwater Elevations and Flow Directions Fall 1992

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, groundwater resources would be the same as the existing conditions described above.

Proposed Action

The delivery of up to 11,000AF/Y of Friant Unit CVP water to the Ranch for groundwater recharge would help protect the local aquifer from overdraft. MID and all other water users pumping groundwater from the aquifer would have the benefit of the use of this water temporarily. Groundwater resources in MID would improve slightly in the short-term.

The Proposed Action would provide water for direct recharge and allow MID to collect data on recharge rates, groundwater movement and groundwater levels. Only 90% of the water recharged would be recovered by in-district pumping so therefore, resulting in a net benefit to the aquifer. The Proposed Action would not adversely affect the groundwater under MID.

MID would not pump groundwater when in-lieu or direct recharge is occurring. This would allow the aquifer benefit of less groundwater pumping.

The excess water in 2006 resulted from extremely wet conditions and high local runoff during the 2006-07 water year which met part of MID's irrigation demand, as well as the purchase of 215-water and the delivery of over 50,000 AF of abandoned water to MID. The amount of surplus water in subsequent years would depend on local hydrology and water management practices made by MID.

Cumulative Effects

MID completed an environmental impact report (EIR) titled *Final Environmental Impact Report for the Madera Irrigation District Water Supply Enhancement Project*. MID is currently evaluating the possibility of establishing a water bank at Madera Ranch. If water bank is established it is anticipated that this would result in positive impacts to groundwater resources. This proposed action is limited to three years and would not contribute to cumulative impacts associated with groundwater resources.

3.3 LAND USE

3.3.1 Affected Environment

MID

Madera Irrigation District lies within Madera County in a very productive agricultural community within the San Joaquin Valley. The City of Madera lies within a portion of MID boundaries and is represented below as the urban land use. As shown in Table 2, the primary land use is for agriculture and the main crops are Grapes and Almonds/Pistachios, based on 2003 crop report (MID, 2001).

TABLE 2: LAND USE IN MADERA IRRIGATION DISTRICT

| Crop | Acres | Percentage |
|--------------------------------------|----------------|-------------------|
| Grapes | 35,748 | 29% |
| Almonds and Other Nuts | 33,284 | 27% |
| Grains (Wheat, Oat Corn) | 20,956 | 17% |
| Alfalfa | 17,258 | 14% |
| Cotton | 7,369 | 6% |
| Fruits | 7,396 | 6% |
| Vegetables | 1,233 | 1% |
| Total Irrigated Acres | 123,271 | 100% |
| Undeveloped Native Vegetation | 210 | |
| Urban Development | 8,066 | |
| Total District Acres | 131,547 | |

The land is currently farmed in alfalfa/wheat (1,184-acres) and vineyards (316-acres) with the irrigation season typically beginning in early April (with sporadic applications in March depending on weather conditions) and running through September (sometimes October depending on weather conditions). Water is supplied by a system of 13 wells and one recycle pump depicted on Figure 2-2, supplemented by surface water deliveries since late 2005. Applied water and evapotranspiration of applied water (ETAW) are estimated to average 6,326 acre-feet per year and 4,492 acre-feet per year respectively.¹

Numerous hydrogeologic investigations by Azurix Corporation (1999-2001) demonstrated that there is no loss of deep percolation to shallow or high salinity perching layers. As a consequence, applied water is either consumptively used through ETAW or deep percolated back to the aquifer. Therefore, all surface water substituted in-lieu of groundwater pumping would be

used to irrigate these fields. MID estimates that in-lieu recharge effort could reduce groundwater pumpage by up to 7,000 acre-feet per year.

MID would deliver available surface water to Sections 1, 13 and one-half of Section 14 of the Ranch for irrigation. During times that surface water is not available, the farmer would irrigate using groundwater. In-lieu recharge, as described above, would be based on annual hydrology and surface water supply availability.

Madera Ranch

Madera Ranch is situated in a rural, unincorporated agricultural area. There are no established communities located within the vicinity of Madera Ranch. The majority of Madera Ranch consists of grasslands used for cattle grazing, with smaller portions of the site in row crop and vineyard agricultural production. Agricultural land uses in the pilot project area comprise a mix of cattle grazing, alfalfa/wheat crops and vineyards. There is existing infrastructure that supports these agricultural lands including access roads, irrigation wells, various utilities, canals and drainage ditches.

3.3.2 Environmental Consequences

No Action

Land use conditions under the No Action Alternative would remain the same as the existing land use conditions described above; therefore, no additional effects to land use are associated with this alternative.

Proposed Action

The Proposed Action would not change land use conditions from existing conditions. All water would move through existing facilities and be placed on existing swales within the Ranch property. The Friant Unit CVP water would not be used to place any untilled or new lands into production, or to convert undeveloped land to other uses. MID would not promote additional land to be farmed. Any water that is delivered to the Ranch as a result of this Proposed Action would be used within the existing swale system for direct recharge. The swale system would not be over utilized causing flooding of adjacent areas. The Proposed Action is pilot recharge involving a small amount of water and would not provide incentive for long-term land use changes. Therefore, no impacts to land use are expected from the Proposed Action.

Cumulative Effects

The Proposed Action when taken into consideration with MID's other water transfer, exchange and banking activities has no potential to induce growth in MID nor would it result in the cultivation of native untilled land. MID would deliver, recharge and recover water using existing facilities. MID would be able to recover water from within its service area for up to 5 years following the cessation of recharge.

3.4 BIOLOGICAL RESOURCES

3.4.1 Affected Environment

Habitats in the Project Area (FIGURE 6)

California Annual Grasslands

California annual grassland is open grassland composed of annual grasses and forbs (Sawyer and Keeler-Wolf 1995). Although the dominant grasses are of Mediterranean or Eurasian origin, the annual and perennial herbs are mostly native to the California Floristic Province. At Madera Ranch, California annual grassland occupies sandy loam soils, primarily of the Pachappa soil series.

Characteristic species include soft chess (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), rattail fescue (*Vulpia myuros*), common fiddleneck (*Amsinckia menziesii*), popcornflower (*Plagiobothrys canescens*), johnny-tuck (*Triphysaria eriantha*), blue dicks (*Dichelostemma capitata*), California goldfields (*Lasthenia californica*), purple owl's-clover (*Castilleja exerta*), and bird's-eye gilia (*Gilia tricolor* ssp. *diffusa*).

Within the California annual grassland community, small areas of accumulated wind-blown sand derived from basin soils are characterized by showy annual wildflower species, including baby blue-eyes (*Nemophila menziesii*), California poppy (*Eschscholzia californica*), sun cup (*Camissonia campestris*), and tidy-tips (*Layia platyglossa*).

California annual grasslands on Madera Ranch have experienced historical agricultural disturbance in areas of Sections 14, 15, 16, 17, 18, and 22. Grassland in Section 22 was disturbed less than 10 years ago, and annual grasses there are similar to those in undisturbed areas, but the areas have not completely recovered. Grassland in Sections 14 and 15 is most similar to other undisturbed areas, but furrows are still evident.

Alkali Grassland

The alkali grassland community on Madera Ranch occurs on strongly saline-alkali soils. This plant community is uncommon and has not been characterized in the ecological literature. In addition to the typical grassland species cited above, perennial and halophytic species are common. Perennial species present in the alkali grasslands include interior goldenbush (*Isocoma acradenia* var. *bracteosa*), locoweed (*Astragalus* sp.), alkali sacaton (*Sporobolus airoides*), and saltgrass (*Distichlis spicata*). The presence of these perennial species suggests that the vegetation in areas of strongly saline-alkali soils historically was a shrub community dominated by saltbush (*Atriplex* sp.) or iodine bush (*Allenrolfea occidentalis*). Except for the absence of shrubby saltbush species, the floristic composition and cover of annual grasses and forbs in alkali grassland at Madera Ranch is very similar to that of Valley saltbush scrub.

Slickspots are common in the alkali grassland. Slickspots are relatively shallow, sparsely vegetated depressions containing strongly saline-alkali soils (Reid et al. 1993). On Madera Ranch, they are interspersed on nearly level interswale landforms that are strongly to slightly saline-alkali and possess a carbonate-silica cemented hardpan at depths of 20–40 inches. The slickspots have a fringe of annual halophytic species, including common spikeweed

(*Centromadia pungens*), bush seepweed (*Suaeda moquinii*), alkali peppergrass (*Lepidium dictyotum*), and large-flowered sand spurry (*Spergularia macrotheca* var. *leucantha*).

As stated in the description of California annual grassland, some areas of alkali grassland have experienced historical agricultural disturbance. However, some areas of alkali grassland either avoided disturbance or have recovered from these activities; during botanical surveys the community was observed in historical agricultural areas in Sections 14, 15, and 22.

Although alkali slick spots and alkali rain pools are found on Madera Ranch within alkali grasslands, none are present in the swale proposed for direct recharge.

Freshwater Marsh

Freshwater marsh is a wetland habitat dominated by emergent perennials, typically tules (*Schoenoplectus* sp.) or cattails (*Typha* sp.). Freshwater marsh occurs in the southeastern corner of Section 16 within the channel of the Gravelly Ford Canal. Dominant species include common bulrush (*Schoenoplectus acutus*), narrow-leaved cattail (*Typha angustifolia*), broad-leaved cattail (*T. latifolia*), and yellow cress (*Rorippa palustris*).

Riparian Woodland

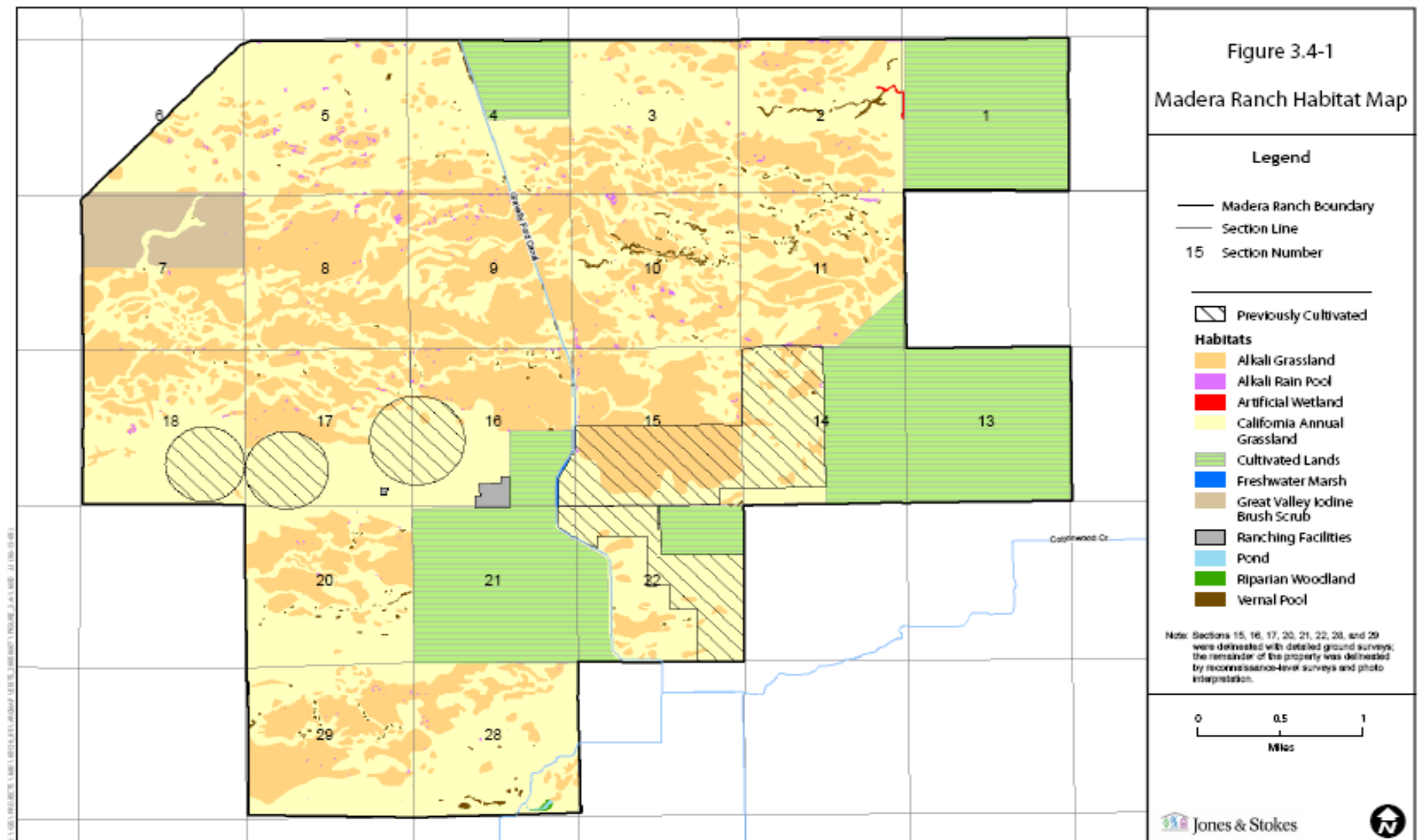
Riparian woodland is an open-canopied, tree-dominated habitat occurring along streams, adjacent to lakes and ponds, or on alluvial fans or floodplains where a high water table is present. The woody canopy is generally dominated by cottonwood (*Populus* sp.) or willow (*Salix* sp.) trees. The understory may be shrubby (willows, blackberry [*Rubus* sp.], wild rose [*Rosa* sp.], buttonwillow [*Cephalanthus occidentalis* var. *californicus*]) or composed primarily of herbaceous species such as mugwort (*Artemisia douglasiana*).

On Madera Ranch, cottonwood and willow trees also occur along the Gravelly Ford Canal on the western side of Section 22 and outside of the pilot area.

Cultivated Lands

As depicted on Figure 2-2, Sections 1, 13 and one-half of Section 14 of the Ranch (totaling 1,500-acres) are proposed as in-lieu recharge areas. These lands are currently farmed in alfalfa/wheat (1,184-acres) and vineyards (316-acres).

FIGURE 6. HABITATS AT MADERA RANCH



Land within the Friant division historically provided habitat for a variety of plant and animals. With the advent of irrigated agriculture and urban development over the last 100 years, many species have become threatened and endangered because of habitat loss. Of approximately 5.6 million acres of valley grasslands and San Joaquin saltbrush scrub, the primary natural habitats across the valley, less than 5 percent remains today. Much of the remaining habitat consists of isolated fragments supporting small, highly vulnerable populations. Data compiled by the California Energy commission indicates that only 15 percent of the Southern San Joaquin Valley remain in some form of natural condition (Reclamation, 2001).

The following list was obtained on November 30, 2006, by accessing the U.S. Fish and Wildlife Database: http://www.fws.gov/sacramento/es/spp_list.htm (061121102524). The list is for the following 7 ½ minute U.S. Geological Survey quadrangles, which are overlapped by MID: Bonita Ranch, Madera, Gregg, Herndon, Lanesbridge, Biola, Gravelly Ford, Firebaugh NE, Berenda, Kismet, Daulton, and Raynor Creek. See Table 6 for the species and critical habitat on the combined list for these quadrangles (FWS, 2006).

TABLE 3: FEDERAL STATUS SPECIES ON QUAD LISTS FOR MID

| <u>Common Name</u> | <u>Species Name</u> | <u>Fed Status</u> | <u>ESA</u> | <u>Summary basis for ESA determination</u> |
|--|------------------------------------|-------------------|------------|---|
| Bald eagle | <i>Haliaeetus leucocephalus</i> | T | NE | No individuals or habitat in area of impact |
| Blunt-nosed leopard lizard | <i>Gambelia sila</i> | E | NE | No individuals or habitat in area of impact |
| Conservancy fairy shrimp | <i>Branchinecta conservatio</i> | E | NE | Some vernal pools in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| California tiger salamander, Central DPS | <i>Ambystoma californiense</i> | T | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| California red-legged frog | <i>Rana aurora draytonii</i> | T | NE | No individuals or habitat in area of effect |
| Central Valley steelhead | <i>Oncorhynchus mykiss</i> | T | NE | No effect on natural stream systems |
| Delta smelt | <i>Hypomesus transpacificus</i> | T | NE | No downstream effects from action |
| Fresno kangaroo rat | <i>Dipodomys nitratoide exilis</i> | E | NE | No individuals or habitat in area of affect; species not trapped since 1992 but may still occur on Alkali Sink Ecological Reserve. |
| Giant garter snake | <i>Thamnophis gigas</i> | T | NE | No individuals or habitat in area of effect |

| | | | | |
|--|-----------------------------------|----|----|---|
| Greene's tuctoria-critical habitat | <i>Tuctoria greenei</i> | CH | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Hairy Orcutt grass | <i>Orcuttia pilosa</i> | E | NE | Some vernal pools in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Hairy orcutt grass-critical habitat | | CH | NE | Some vernal pools in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Fleshy Owl's Clover | <i>Castilleja campestris spp.</i> | T | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Fleshy Owl's Clover-Critical Habitat | <i>succulenta</i> | CH | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| | | | | Occurs in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| San Joaquin kit fox | <i>Vulpes macrotis mutica</i> | E | NE | No construction of new facilities; no conversion of lands from existing uses |
| San Joaquin Valley Orcutt Grass | <i>Orcuttia inaequalis</i> | T | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| San Joaquin Valley Orcutt Grass critical habitat | | CH | NE | Occurs in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Valley elderberry | <i>Desmodium californicum</i> | T | NE | No elderberry shrubs in area of effect |
| longhorn beetle | <i>dimorphus</i> | | | |
| Vernal pool fairy shrimp | <i>Branchinecta lynchi</i> | T | NE | Documented recent occurrences in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |
| Vernal pool fairy shrimp - critical habitat | | CH | NE | Occurs in eastern portion of the district, but no conversion of native lands or lands fallowed for three years or more, no new facilities |
| Vernal pool tadpole shrimp | <i>Lepidurus packardii</i> | E | NE | Some vernal pools in eastern portion of the district, but no conversion of native lands or lands fallowed and untilled for three years or more, no new facilities |

3.4.2 Environmental Consequences

No Action

Under the No Action Alternative, MID would not directly recharge Friant Unit CVP water at the Ranch. Delivery of MID's pre-1914 water to the Ranch swales for recharge would continue.

Proposed Action

The Proposed Action would be consistent with the current operations at MID. Demands have been met and conditions in MID that support biological resources would not change. The water delivered to lands in Madera Ranch would be used to directly recharge the aquifer. The construction of new facilities would not be required to bring the water to these locations, and the Proposed Action would bring no native or untitled lands into production. Orchards provide some habitat for the San Joaquin kit fox, but the habitat value is relatively small, and would not be affected by the Proposed Action.

Critical habitat has been designated by the U.S. Fish & Wildlife Service for vernal pool fairy shrimp within MID. However, the units of critical habitat for vernal pool fairy shrimp are found in the eastern portion of MID. Critical habitat designations for plant species occur in the eastern portion of MID and are not found within the action area. Critical habitat would not be affected by the Proposed Action, because no constituent elements would be altered within the action area.

There are no waterways containing sensitive fishes that would be affected by the Proposed Action. Kern Brook lamprey, a species which continues to live in the siphons of the Madera Canal as long as it contains water, would not be affected. There are no sensitive or special-status fish species which occur in the conveyance facilities that would be used in the project, therefore there would be no effect on the delta smelt, anadromous salmonids, critical habitat for the delta smelt or salmonids, or the southern DPS of the North American green sturgeon. Likewise, there will be no effect on any essential fish habitat (EFH) covered by a Federal Fishery Management Plan.

The Proposed Action would not change the availability or quality of any habitat for the California least tern, because no waterways or nesting areas will be created, destroyed or modified in any way.

Cumulative Effects

As the Proposed Action itself has no impacts on special-status plant, fish or wildlife resources, it does not contribute to cumulative impacts on those resources.

3.5 CULTURAL RESOURCES

3.5.1 Affected Environment

Cultural Resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The San Joaquin Valley is rich in historical and pre-historic cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The lands have historically been cultivated

for agricultural purposes and have been routinely tilled and irrigated. Any archaeological resources that may be present have likely been impacted by these agricultural practices.

The CVP is being evaluated for the National Register of Historic Places (NRHP). Facilities include the Friant Dam, Friant-Kern Canal, Tracy Pumping Plant, and Delta-Mendota Canal.

Friant Dam is located on the San Joaquin River, 25 miles northeast of Fresno, California. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet.

The following discussion of cultural resources is based on a review of existing information regarding the prehistoric, ethnographic, and historical context of the Project vicinity. Additional information was requested from the Native American Heritage Commission (NAHC) and from Native American individuals with knowledge of resources of concern to Native Americans within the Project vicinity. Jones & Stokes conducted a preliminary field visit, consulted historic maps, and conducted a mixed-strategy survey of the Project vicinity to identify cultural resources. Additionally, historical research was carried out in Sacramento and the Madera vicinity to evaluate cultural resources identified in the field.

Pre-field Research

Records Search

A records search was conducted at the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield. The record searches indicate that no cultural resource studies have been conducted within the Project vicinity, and five cultural resource investigations have been conducted within a 0.5-mile radius of the Project vicinity (Riddell 1975). Although no archaeological sites have been recorded within the Project vicinity, a Heuchi Yokuts village, Ch'ekayu, was located on the northern side of the Fresno River in the vicinity of Road 23 (Kroeber 1976:Plate 47).

Historical Research

Jones & Stokes conducted historical research of numerous local and statewide libraries and contacted the Madera County Historical Society in Madera requesting information on known historic resources within the Project vicinity. No information regarding cultural resources in the Project vicinity resulted from this consultation.

Native American Consultation

On April 4, 2000, and again on March 3 and 7, 2005, Jones & Stokes requested that NAHC staff members in Sacramento conduct a search of the sacred lands file for cultural resources. NAHC personnel reported that no cultural resources listed in the sacred lands file are present in the Project vicinity. They also provided Jones & Stokes with a list of interested Native American individuals and organizations who may have knowledge of cultural resources in the Project vicinity. Jones & Stokes contacted each Native American contact by letter and telephone. To date, no information regarding cultural resources in the Project vicinity was yielded through this consultation.

Field Visit and Map Research

Madera Ranch was systematically surveyed to identify cultural resources. Although cultural resources need to be identified for the entire Project vicinity, research indicates that some areas are more sensitive for cultural resources than others. As such, it is reasonable to distinguish between low- and high-sensitivity areas and to use intensive survey methods in highly sensitive areas.

This survey was partitioned into two categories: sensitive areas (650 acres) and non-sensitive areas (1,957 acres). Sensitive areas were slated for complete survey coverage, non-sensitive areas for a sample survey based on simple random selection of survey units.

Sensitive areas on Madera Ranch were identified by pre-field research as areas that contain a concentration of historic resources, areas that now-extinct watercourses (identified by historical research) traversed, and areas presently containing watercourses. Low-sensitivity areas were defined as topographically flat portions of Madera Ranch that lacked concentrations of identified historic resources and former or existing drainages. Much of Madera Ranch was used for livestock grazing and equestrian training, with the result that the majority of the property was left undeveloped. Cultural resources are unlikely to occur in these areas.

The sensitive areas (650 acres) were surveyed by walking transects spaced 100 feet between surveyors. Non-sensitive areas were subject to a sample survey based on simple random selection of survey units. The 1,957 acres of non-sensitive Project vicinity were divided into 49 units of 40 acres. Ten units were selected randomly for survey, resulting in a survey of 400 acres or 20% of the non-sensitive area. The survey itself was conducted systematically using 100-foot transect intervals.

Findings

As a result of pre-field research, historical research, and the 2000 field survey, seven cultural resources were identified within the Ranch and evaluated for NRHP and California Register of Historical Resources (CRHR) significance. These cultural resources are presented in Table 3-2. A detailed description and significance evaluation of these resources have been previously documented (Jones & Stokes 2002). None of these cultural resources appear to meet the significance criteria for NRHP or CRHR listing.

TABLE 4. CULTURAL RESOURCE SITES IDENTIFIED AT MADERA RANCH

| Site Number | Description |
|------------------|--|
| JSA-Cultural-2 | Gravelly Ford Canal |
| JSA-Cultural-6 | Road 17 Segment |
| JSA-Cultural-18 | Concrete Footings |
| JSA-Cultural-21 | Historic Road |
| JSA-Cultural-22 | Water Pumping Location and Access Road |
| JSA-Cultural-A-1 | Irrigation Ditch |
| JSA-Cultural-B-6 | Concrete Ditch |

Jones & Stokes' 2005 map research and field visit to portions of the Project vicinity outside of Madera Ranch identified the Main No. 2 Canal, Section 8 Canal, and 24.2 Canal as cultural resources. Each of these features is described below.

Main No. 2 Canal

The Main No. 2 Canal is an earthen ditch that parallels Cottonwood Creek. The ditch pulls water from MID's Main Canal, east of Madera. The Main No. 2 Canal was a component of the Madera Canal & Irrigation Company (MC&IC) and was constructed prior to 1872 by engineer Alfred Poett.

Section 8 Canal

The Section 8 Canal is a 2-mile earthen ditch that parallels the south side of Avenue 10 between Road 21 and Road 23. The canal intersects Main No. 2 Canal and Cottonwood Creek at Road 23. The Section 8 Canal was originally part of the MC&IC system (Howard, pers. comm., 2006). It was built in the late nineteenth century.

24.2 Canal

Reclamation completed construction of the 24.2 Canal and other irrigation works under contract to MID in 1955 (Madera Irrigation District 1981:6). The 4-mile long lateral is of earthen construction. It extends from Main No. 1 Canal near the Fresno River south along Road 22 ½ to its terminus north of Avenue 11.

Existing Conditions

A concise summary of regional prehistoric, ethnographic, and historic backgrounds is presented below. A detailed discussion of the regional setting for cultural resources has been previously documented (Jones & Stokes 2002).

Prehistory

The Project vicinity lies within the San Joaquin Valley cultural region (Moratto 1984). This region comprises the following four complexes, which describe specific cultural traits within a given time period:

- the Positas Complex (3300–2600 B.C.),
- the Pacheco Complex (2600 B.C.–A.D. 300),
- the Gonzaga Complex (A.D. 300–1000), and

- the Panoche Complex (A.D. 1500–European contact).

Ethnography

The Project vicinity lies within the traditional homelands of the Northern Valley Yokuts (specifically the Huechi and Hoyima Yokuts), whose territory extended southward from just north of the Calaveras River to the bend of the San Joaquin River near Fresno. The foothills of the Diablo Range probably marked the western boundary of Northern Valley Yokuts territory, while the eastern boundary is at the lower foothills of the Sierra Nevada. The Northern Valley Yokuts made their livelihood through fishing and hunting and gathering various plant foods, especially acorns. Most principal settlements sat perched on top of low mounds, on or near the banks of large watercourses. The elevated positions helped to keep the inhabitants, their houses, and their possessions above the waters of the spring floods. A strong tendency toward residence in permanent villages, fostered by the abundant riverine resources, was evident; the same sites were occupied for generations (Kroeber 1976).

Historical Content

This historical context focuses on the development of irrigation in the Madera area, since the three newly identified cultural resources (Main No. 2 Canal, 24.2 Canal, and Section 8 Canal) are associated with this theme. The following information is excerpted from Jones & Stokes (2002:7–12). It should be noted that this section is derived from several sources. In some instances, these sources are not consistent with one another.

The development of large-scale irrigation literally changed the face of California by allowing for the development of large-scale agriculture, residential and industrial power, and substantial new recreation areas. The Spanish and Mexicans had practiced irrigation on a limited scale by diverting water from streams to mission orchards, gardens, and pueblos via open ditches. The development of large farms in the post-gold rush era and a series of devastating droughts in the 1860s, however, provided the impetus for the construction of more extensive irrigation projects. (Hart 1978:205.)

The building of the area's irrigation systems spurred development of the region's rich agricultural industry from the 1870s to the present. People began settling in Madera County to establish farming colonies. In time, several self-sufficient communities emerged, prompting the development of infrastructure and small industries. The growth of Madera County is tied to the region's agricultural development. Wine grapes, raisins, figs, cotton, alfalfa, fruit, and seed and field crops are historically important crops and remain economically significant today (Clough 1968).

Jones & Stokes conducted pre-field research, historical research, and a field survey (2000). Seven cultural resources were identified within Madera Ranch and evaluated for NRHP and California Register of Historical Resources (CRHR) significance. These cultural resources are presented in Table 4.

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative, there are no impacts to cultural resources as no modifications to existing facilities and no new facilities would be constructed. Existing recharge and extraction operations would continue to operate as has historically occurred. Current recharge and extraction operations would continue to operate within existing facilities. There would be no potential to affect historic properties.

Proposed Action

The conveyance of Friant Unit CVP would not harm any cultural resources. All of the water sources involved would be conveyed in existing facilities to established agricultural land or to the swale system at the Ranch. No excavation or construction is required to convey, recharge or recover the water. The short duration of this water would not result in changes to current conditions at MID. Consequently, the undertaking is not a type of activity with the potential to impact cultural resources eligible to the NRHP.

Cumulative Effects

The Proposed Action when added to the previous transfer and exchange activities and reasonably foreseeable transfer and exchange activities of MID does not contribute to cumulative affects to archeological or cultural resources.

3.6 INDIAN TRUST ASSETS

3.6.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the U.S. for federally-recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the U.S. is the trustee. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the U.S. The characterization and application of the U.S. trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

Consistent with President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," Bureau of Reclamation (Reclamation) assesses the effect of its programs on tribal trust resources and federally-recognized tribal governments. Reclamation is tasked to actively engage federally-recognized tribal governments and consult with such tribes on government-to-government level (59 Federal Register 1994) when its actions affect ITAs. The U.S. Department of the Interior (DOI) Departmental Manual Part 512.2 ascribes the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (DOI 1995). DOI is required to "protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion" (DOI 2000). Reclamation is responsible for assessing whether the proposed pilot project by the MID to recharge surface water beneath the property known as Madera Ranch (Ranch) has the potential to affect ITAs.

It is the general policy of the DOI to perform its activities and programs in such a way as to protect ITAs and avoid adverse effects whenever possible. MID's proposed pilot project to recharge surface water beneath the property known as Madera Ranch would be implemented to ensure compliance with this policy. In addition, Reclamation would comply with procedures contained in Departmental Manual Part 512.2, guidelines, which protect ITAs.

There are no Indian Trust Assets affected by this action. The nearest Indian trust assets to this action are located at the Table Mountain Rancheria 33.27 miles east/northeast of the site.

3.6.2 Environmental Consequences

No Action

Conditions would remain the same as existing conditions under the No Action Alternative; therefore there are no impacts to Indian Trust Assets.

Proposed Action

There are no tribes possessing legal property interests held in trust by the United States in the water involved with this action, nor is there such a property interest in the lands designated to receive the water proposed in this action. The nearest Indian trust assets to this action are located at the. This action will have no adverse impacts on Indian trust assets.

Cumulative Effects

The Proposed Action when added with the does not contribute to cumulative affects to ITAs.

3.7 SOCIOECONOMIC RESOURCES

3.7.1 Affected Environment

The socioeconomic setting is dependant upon population, employment, housing, and revenues earned by the primary private employers. As stated earlier, MID is comprised primarily of irrigated agricultural lands. There are many communities across the area where farm workers reside. There are many small businesses that support agriculture such as feed and fertilizer sales, machinery sales and service, pesticide applicators, transport, packaging, and marketing.

Madera County is primarily a rural agricultural community and contributes to its vigorous economic force. Farm workers reside in homes within or close to Madera County. There are many small businesses that support agriculture like feed and fertilizer sales, machinery sales and service, pesticide applicators, transport, packaging, marketing and other associated jobs, in recent years there has been a growing retail business and the future looks to be heading this way. Madera County has lower business start-up costs and cost of living expenses that add to its attractiveness as well (MID, 2001).

3.7.2 Environmental Consequences

No Action

The socioeconomic conditions under the No Action Alternative would be the same as they would be under existing conditions described in the Affected Environment; therefore, no additional impacts are associated with this alternative.

Proposed Action

The Proposed Action would not induce population growth within MID, nor would seasonal labor requirements change. Agriculturally dependent businesses would not be affected by the Proposed Action. No adverse impacts to public health and safety would occur. The Proposed Action would not have highly controversial or uncertain environmental impacts or involve unique or unknown environmental risks. The Proposed Action would continue to support the economic vitality in the region. MID is responsible for managing water for the benefit of agriculture, since they exist to support growers within the district. Maximizing the use of water service actions is beneficial to local economic conditions and agricultural employment.

Cumulative Effects

Other past, present and foreseeable future water exchange actions would not have highly controversial or uncertain environmental impacts or involve unique or unknown environmental risks, nor would they have cumulatively significant environmental impacts to socioeconomic resources.

3.8 ENVIRONMENTAL JUSTICE

3.8.1 Affected Environment

As mandated by Executive Order 12898 (E.O. 12898), published February 11, 1994, entitled, “Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations”, this EA addresses potential environmental justice concerns. The population of some small communities typically increases during late summer harvest. The market for seasonal workers on local farms draws thousands of migrant workers, commonly of Hispanic origin from Mexico and Central America.

3.8.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on environmental justice. MID would continue to engage opportunities to maximize management of their water supply within the facilities available to them either in district or utilizing other district’s facilities as approved by Reclamation. Conditions would be the same as the existing conditions; therefore, no additional impacts are associated with this alternative.

Proposed Action

The Proposed Action involves recharging water outside the MID service area. The amount of crops or agricultural lands would not change as a result of the Proposed Action. The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease. The Proposed Action would not disproportionately impact economically disadvantaged or minority populations. No impacts relevant to Environmental Justice are anticipated because

the project does not include any construction or development of project facilities, or any change in operations that would affect the general public.

Cumulative Effects

The Proposed Action would not have any measurable impact on minority or disadvantaged populations within MID in conjunction with other activities.

SECTION 4 CONSULTATION AND COORDINATION

4.1 FISH AND WILDLIFE COORDINATION ACT (16 USC § 651 ET SEQ.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect wildfire resources. The Proposed Action does not involve the loss or damage to any wildlife resources; therefore, the FWCA does not apply.

4.2 ENDANGERED SPECIES ACT (16 USC § 1521 ET SEQ.)

Section 7 of the Endangered Species Act requires federal agencies, in consultation with the Secretary of the Interior and/or Commerce, to ensure that their actions do not jeopardize the continued existence of federally endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

Reclamation has determined the Proposed Action would have no effect on federally proposed or listed threatened and endangered species or their proposed or designated critical habitat. No further consultation is required under Section 7 of the Endangered Species Act. This determination is based on the fact that the Proposed Action involves water already allocated and available to MID and all water demands in MID have been met. Habitat types and conditions that support biological resources in MID would not change. The Proposed Action would support existing land uses and conditions. No native lands or lands fallowed and untilled for three years or more would be converted or cultivated with CVP water.

4.3 MAGNUSON-STEVENS ACT FISHERY CONSERVATION AND MANAGEMENT ACT (16 USC § 1801 ET SEQ.)

The Magnuson-Stevens Act (MSA) requires Federal agencies to consult with the NMFS on activities that may adversely affect EFH (MSA section 305(b)(2))1. There is no EFH located within the Proposed Action Area. Therefore, Reclamation has determined that there would be no effects on any EFH as a result of the Proposed Action.

4.4 NATIONAL HISTORIC PRESERVATION ACT (15 USC § 470 ET SEQ.)

Section 106 of the National Historic Preservation Act requires federal agencies to evaluate the effects of federal undertakings on historical, archaeological and cultural resources. Due to the nature of the Proposed Action, there would be no impacts to any historical, archaeological or cultural resources, and no further compliance actions are required.

SECTION 5 LIST OF PREPARERS AND REVIEWERS

Laura Myers, Natural Resource Specialist, SCCAO
Patricia Rivera, Native American Affairs, MP Region
Tamara LaFramboise, Environmental Specialist, MP Region
Brad Hubbard, Environmental Specialist, MP Region
Jim James, Consultant, Jones & Stokes

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SECTION 7 APPENDIX A. FISH AND WILDLIFE SPECIES LIST

United States Department of the Interior
FISH AND WILDLIFE SERVICE



Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

November 30, 2006

Document Number: 061130125619

Jim James
Jones & Stokes Associates
2773 25th Street
Sacramento, Ca 95818

Subject: Species List for Madera Irrigation District Water Banking Pilot Project

Dear: Mr. Jim James

We are sending this official species list in response to your November 30, 2006 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 28, 2007.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division



Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the Counties and/or
U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 061130125619

Database Last Updated: October 27, 2006

Species of Concern - The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. See www.fws.gov/sacramento/es/spp_concern.htm for more information and links to these sensitive species lists.

Red-Legged Frog Critical Habitat - The Service has designated final critical habitat for the California red-legged frog. The designation became final on May 15, 2006. See our [map index](#).

MADERA (380A)

Listed Species

Invertebrates

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Reptiles

Gambelia (= *Crotaphytus*) *sila*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Birds

Haliaeetus leucocephalus

bald eagle (T)

Mammals

Dipodomys nitratoides exilis

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Orcuttia pilosa

hairy Orcutt grass (E)

BONITA RANCH (380B)

Listed Species

Invertebrates

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Birds

Haliaeetus leucocephalus

bald eagle (T)

Mammals

Dipodomys nitratoides exilis

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

GRAVELLY FORD (380C)**Listed Species***Invertebrates**Branchinecta lynchi*

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

*Fish**Hypomesus transpacificus*

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

*Amphibians**Ambystoma californiense*

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

*Reptiles**Gambelia (=Crotaphytus) sila*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

*Birds**Haliaeetus leucocephalus*

bald eagle (T)

*Mammals**Dipodomys nitratoide exilis*

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

BIOLA (380D)**Listed Species***Invertebrates**Branchinecta lynchi*

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana aurora draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Birds

Haliaeetus leucocephalus
bald eagle (T)

Mammals

Dipodomys nitratoide exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

FIREBAUGH NE (381A)**Listed Species***Invertebrates*

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

*Reptiles**Gambelia (=Crotaphytus) sila*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

*Birds**Haliaeetus leucocephalus*

bald eagle (T)

*Mammals**Dipodomys nitratoides exilis*

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

MENDOTA DAM (381D)**Listed Species***Invertebrates**Branchinecta lynchi*

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

*Fish**Hypomesus transpacificus*

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

*Amphibians**Ambystoma californiense*

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

*Reptiles**Gambelia (=Crotaphytus) sila*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Birds

Haliaeetus leucocephalus

bald eagle (T)

Mammals

Dipodomys nitratooides exilis

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Candidate Species

Birds

Coccyzus americanus occidentalis

Western yellow-billed cuckoo (C)

BERENDA (400C)

Listed Species

Invertebrates

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

*Birds**Haliaeetus leucocephalus*

bald eagle (T)

*Mammals**Dipodomys nitratoide exilis*

Fresno kangaroo rat (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

*Plants**Castilleja campestris ssp. succulenta*

succulent (=fleshy) owl's-clover (T)

KISMET (400D)**Listed Species***Invertebrates**Branchinecta conservatio*

Conservancy fairy shrimp (E)

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

*Fish**Hypomesus transpacificus*

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

*Amphibians**Ambystoma californiense*

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

*Reptiles**Gambelia (=Crotaphytus) sila*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

*Birds**Haliaeetus leucocephalus*

bald eagle (T)

Mammals

Dipodomys nitratooides exilis

Fresno kangaroo rat (E)

Plants

Orcuttia inaequalis

Critical habitat, San Joaquin Valley Orcutt grass (X)

Tuctoria greenei

Critical habitat, Greene's tuctoria (=Orcutt grass) (X)

CHOWCHILLA (401D)

Listed Species

Invertebrates

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) *silae*

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Birds

Haliaeetus leucocephalus

bald eagle (T)

Mammals

Dipodomys nitratooides exilis

Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

County Lists

No county species lists requested.

Key:

- (E) *Endangered* - Listed as being in danger of extinction.
- (T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
- (P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat* - Area essential to the conservation of a species.
- (PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
- (C) *Candidate* - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the nine surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared

for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by

section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be February 28, 2007.